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| 10/066,069 | 01/31/2002 | Liqin Dong | CISCP744 | 2503 |

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Cindy S. Kaplan
P.O. BOX 2448
SARATOGA, CA 95070

| EXAMINER | |
|---|---|
| KHOO, FOONG LIN | |

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DATE MAILED: 12/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. 10/066,069 | Applicant(s) DONG ET AL. | |
|---|---|---|---|
| | Examiner F. Lin Khoo | Art Unit 2664 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *31 January 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5/13/2002*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 9, 10, 12, 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Nomura (U.S. Publication No. 2002/0103924).

Regarding Claim 1, Nomura discloses a method for defining hardware routing paths in a network having IP paths and MPLS paths (see paragraph [0001]), the method comprising:

assigning a path ID for each path within a path group, the path ID for each path comprising an IP address, wherein the path group contains IP paths, MPLS paths, or both IP and MPLS paths (see Fig.2, Fig. 4A, Fig. 4B, Fig. 6; see paragraphs [0042, 0051, 0098]. The aggregation path ID is associated with the path ID, G-1 in the group ID is associated with the path group and the IP address is associated with the originating and destination sites. IP and MPLS paths are included in the label allocation

request message in Fig. 2 and are also associated with logical path and MPLS labels in Fig. 6);

comparing all path IDs in each path group (see Fig. 5 (step P5); see paragraphs [0049, 0064 through 0073]); and

assigning a common hardware resource to groups having matching path IDs (see paragraphs [0012, 0013, 0048]. The shared bandwidth (or aggregation bandwidth) reserved for a plurality of paths through common LSR (label switch routers) in Fig. 1, a path having the same ID of either the originating site or the destination site retrieved out of the existing paths belonging to the same group ID, when the same ID is found, the sum of the bandwidth acquired in the existing aggregated path (referred to as aggregation bandwidth) and the path request bandwidth is obtained are all associated with assigning a common hardware resource to groups having matching path IDs).

Regarding Claim 9, Nomura discloses further comprising sorting the paths in each of the path groups (see paragraph [0092]. Classifying and identifying packets to be bandwidth-controlled, and performing flow control (bandwidth control) against the identified packets is associated with sorting the paths in each of the path groups).

Regarding Claim 10, Nomura discloses wherein sorting the paths comprises sorting the paths by the value of the path ID (Fig. 7, see paragraphs [0104 through 0109]. An aggregation path ID obtained from an aggregation path ID table 201 is used as the ID value at the time of path establishment. First the upper 8 bit in label value I of

an MPLS packet is inspected. Then a packet having the same aggregation path ID or `01` in this case, is inserted into queue 1. A packet having any other value than the above is treated as a packet of a best-effort type for which bandwidth is not guaranteed. Namely, the packet is inserted in a best-effort queue from which the packet is read out only when no other packet exists for transmission. Inspecting the upper 8 bit in label value of an MPLS packet and determining whether a packet having the same aggregation path ID or any other value is equivalent to sorting the paths by the value of the path ID).

Regarding Claim 12, Nomura discloses a system for defining hardware routing paths in a network having IP paths and MPLS paths (see paragraph [0001]), the system comprising:

a processor (see paragraph [0044, 0045]. At each node a server which inherently has a processor is constituted so as to provide the functions) operable to assign a path ID for each path within a path group, the path ID for each path comprising an IP address (see Fig.2, Fig. 4A , Fig. 4B, Fig. 6; see paragraphs [0042, 0051, 0098]. The aggregation path ID is associated with the path ID, G-1 in the group ID is associated with the path group and the IP address is associated with the originating and destination sites), compare all path IDs in each path group (see Fig. 5 (step P5); see paragraphs [0049, 0064 through 0073]), and assign a common hardware resource to groups having matching path IDs (see paragraphs [0012, 0013, 0048]. The shared bandwidth (or aggregation bandwidth) reserved for a plurality of paths through common LSR (label

switch routers) in Fig. 1, a path having the same ID of either the originating site or the destination site retrieved out of the existing paths belonging to the same group ID, when the same ID is found, the sum of the bandwidth acquired in the existing aggregated path (referred to as aggregation bandwidth) and the path request bandwidth is obtained are all associated with assigning a common hardware resource to groups having matching path IDs) , wherein the path group contains IP paths, MPLS paths, or both IP and MPLS paths (see Fig.2, Fig. 4A , Fig. 4B, Fig. 6; see paragraphs [0042, 0051, 0098. IP and MPLS paths are included in the label allocation request message in Fig. 2 and are also associated with logical path and MPLS labels in Fig. 6); and

memory for storing the path IDs (see paragraph [0044, 0045, 0060]. When the connection between site A and site B is started, an LDP message is transmitted from LER1 to LER2. In this message, the group ID of "G-1", the originating site ID of "A" and the originating bandwidth of "5 Mbps" are stored among information given in advance for site A. Storing of data in the message is associated with a memory for storing the path IDs).

Regarding Claim 17, the limitations correspond to a computer program product which are similar in scope as that of claim 12 and hence are rejected for the same reasons set forth above (Note: see paragraph [0044, 0045]. At each node a server inherently has a processor executing software program code constituted so as to provide the functions. The software program code in the server is inherently stored in a storage medium).

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 2-8, 11, 13, 14, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nomura (U.S. Publication No. 2002/0103924) in view of Ku et al. (U. S. Patent No. 6,553,030).

Regarding Claim 2, Nomura discloses assigning a path ID for each path within a path group, the path ID for each path comprising an IP address, wherein the path group contains IP paths, MPLS paths, or both IP and MPLS paths; comparing all path IDs in each path group; and assigning a common hardware resource to groups having matching path IDs. Nomura does not disclose wherein assigning a path ID for each IP path comprises assigning a unicast IP address. Ku et al. discloses assigning a path ID for each IP path comprises assigning a unicast IP address (col 6, lines 64-67; col 14, lines 30-40. The destination key identifies the appropriate destination path for the packet and indicates whether the packet is uni-cast or multicast using MPLS as a preferred method for directing data throughout the network 100 in Fig. 1 and this is associated with assigning a path ID for each IP path comprises assigning a unicast IP address). It would have been obvious to one of ordinary skill in the art at the time the

invention was made to use the uni-cast packet as taught by Ku et al. in the method of Nomura to provide an advantage of communicating data of different types and formats (col 24, lines 26-28).

Regarding Claim 3, Nomura and Ku et al. disclose the limitation of claim 2. Further, Ku et al. discloses wherein the unicast IP address corresponds to the IP path's next hop IP address (Fig. 2, col 8, lines 12-35. Identifying a next hop in the label switched path is associated with the unicast IP address which corresponds to the IP path's next hop IP address).

Regarding Claim 4, Nomura and Ku et al. disclose the limitation of claim 2. Further, Ku et al. discloses wherein assigning a path ID for each MPLS path comprises assigning a unique IP multicast address (col 6, lines 64-67; col 14, lines 30-40. The destination key identifies the appropriate destination path for the packet and indicates whether the packet is uni-cast or multicast using MPLS as a preferred method for directing data throughout the network 100 in Fig. 1 and this is associated with assigning a path ID for each MPLS path comprises assigning a unique IP multicast address).

Regarding Claim 5, Nomura and Ku et al. disclose the limitation of claim 4. Further, Nomura discloses wherein assigning a unique IP multicast address comprises assigning a unique IP address from an internal managed group of Ids (see paragraphs [0095, 0096, 0097, 0098]. In an MPLS packet header, the managing entity can allocate

each value arbitrarily at the time of path establishment. Therefore, it is possible to set an ID having a common header value locally shared by the different paths to be aggregated. For example, a field in MPLS header to be used for identifying packets (paths) consists of 20 bits. MPLS packets transmitted using a path between A and B, and A and C, are provided with different value of Label1 and Label2, respectively, having length of 20 bits. In case the packets in concern belong to the same aggregation path, for example, the first 8 bits are allocated for identifying aggregation path, and the latter 12 bits are allocated for identifying individual paths, being used by respective LER1 to LER5, LSR6 and LSR7. The managing entity is associated with assigning a unique IP multicast address comprises assigning a unique IP address from an internal managed group of Ids).

Regarding Claim 6, Nomura and Ku et al. disclose the limitation of claim 5. Further, Nomura discloses wherein the internal managed group of IDs is sufficiently large to represent all network hardware paths (see paragraphs [0095, 0096, 0097, 0098]. In an MPLS packet header, the managing entity can allocate each value arbitrarily at the time of path establishment. Therefore, it is possible to set an ID having a common header value locally shared by the different paths to be aggregated. For example, a field in MPLS header to be used for identifying packets (paths) consists of 20 bits. MPLS packets transmitted using a path between A and B, and A and C, are provided with different value of Label1 and Label2, respectively, having length of 20 bits. In case the packets in concern belong to the same aggregation path, for example,

the first 8 bits are allocated for identifying aggregation path, and the latter 12 bits are allocated for identifying individual paths, being used by respective LER1 to LER5, LSR6 and LSR7. The field in MPLS header to be used for identifying packets (paths) consists of 20 bits which is equivalent to the internal managed group of IDs sufficiently large to represent all network hardware paths).

Regarding Claim 7, Nomura and Ku et al. disclose the limitation of claim 5. Further, Nomura discloses wherein assigning a unique IP address comprises assigning a unique IP address for each software MPLS path entity (see paragraphs [0151, 0159]. The bandwidth allocation message includes an aggregation path ID by which paths to be aggregated by each LER and LSR can uniquely be determined, and the information of the aggregation bandwidth. Further, the server is provided with functions of ordering to transmit the above-mentioned message to the destination LER via transit LSR, and deciding aggregation path and calculating bandwidth. This enables each LER and LSR to determine uniquely to which path each path for inter-site communication shall be aggregated based on the information of the aggregation path ID and the aggregation bandwidth and therefore is equivalent to assigning a unique IP address comprises assigning a unique IP address for each software MPLS path entity).

Regarding Claim 8, Nomura and Ku et al. disclose the limitation of claim 7. Further, Nomura discloses comprising returning an assigned unique IP address to the group of internal managed IDs when a path entity is deleted (Fig. 12, see paragraphs

[0133, 0140]. When a certain site is abolished, all paths originating or destination the relevant site must be deleted. When deleting these paths, recalculation of the aggregation bandwidth is required against the other paths having the same aggregation path ID is associated with returning an assigned unique IP address to the group of internal managed IDs when a path entity is deleted).

Regarding Claim 11, Nomura discloses assigning a path ID for each path within a path group, the path ID for each path comprising an IP address, wherein the path group contains IP paths, MPLS paths, or both IP and MPLS paths; comparing all path IDs in each path group; and assigning a common hardware resource to groups having matching path IDs. Nomura further discloses comparing the group paths (Fig. 5, see paragraphs [0049, 0064, 0130]. Comparing the bandwidth capacity of the related access lines is equivalent to comparing the group paths). Nomura does not disclose building a database containing all path groups. Ku et al. discloses a database for multicast ID list and identification of the LSP look-ups (Fig. 6, element 612, col 16, lines 18-21 and col 20, lines 7-11). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the database as taught by Ku et al. in the method of Nomura to perform the comparison in order to provide an advantage of communicating data of different types and formats (col 24, lines 26-28).

Regarding Claim 13, Nomura discloses a processor operable to assign a path ID for each path within a path group, the path ID for each path comprising an IP address,

compare all path IDs in each path group, and assign a common hardware resource to groups having matching path IDs, wherein the path group contains IP paths, MPLS paths, or both IP and MPLS paths; and memory for storing the path IDs. Nomura does not disclose wherein the path IDs assigned for IP paths comprise unicast IP addresses. Ku et al. discloses wherein the path IDs assigned for IP paths comprise unicast IP addresses (col 6, lines 64-67; col 14, lines 30-40. The destination key identifies the appropriate destination path for the packet and indicates whether the packet is uni-cast or multicast using MPLS as a preferred method for directing data throughout the network 100 in Fig. 1 and this is associated with assigning a path ID for each IP path comprises assigning a unicast IP address). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the unicast packet as taught by Ku et al. in the method of Nomura to provide an advantage of communicating data of different types and formats (col 24, lines 26-28).

Regarding Claim 14, Nomura discloses a processor operable to assign a path ID for each path within a path group, the path ID for each path comprising an IP address, compare all path IDs in each path group, and assign a common hardware resource to groups having matching path IDs, wherein the path group contains IP paths, MPLS paths, or both IP and MPLS paths; and memory for storing the path IDs. Nomura does not disclose wherein the path IDs assigned for MPLS paths comprise unique IP multicast addresses. Ku et al. discloses wherein the path IDs assigned for MPLS paths comprise unique IP multicast addresses (col 6, lines 64-67; col 14, lines 30-40. The

destination key identifies the appropriate destination path for the packet and indicates whether the packet is uni-cast or multicast using MPLS as a preferred method for directing data throughout the network 100 in Fig. 1 and this is associated with assigning a path ID for each MPLS path comprises assigning a unique IP multicast address). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the multicast packet as taught by Ku et al. in the method of Nomura to provide an advantage of communicating data of different types and formats (col 24, lines 26-28).

Regarding Claim 16, Nomura discloses a processor operable to assign a path ID for each path within a path group, the path ID for each path comprising an IP address, compare all path IDs in each path group, and assign a common hardware resource to groups having matching path IDs, wherein the path group contains IP paths, MPLS paths, or both IP and MPLS paths; and memory for storing the path IDs. Nomura further discloses multicast IP addresses sufficiently large to represent all network hardware paths (see paragraphs [0095, 0096, 0097, 0098]. In an MPLS packet header, the managing entity can allocate each value arbitrarily at the time of path establishment. Therefore, it is possible to set an ID having a common header value locally shared by the different paths to be aggregated. For example, a field in MPLS header to be used for identifying packets (paths) consists of 20 bits. MPLS packets transmitted using a path between A and B, and A and C, are provided with different value of Label1 and Label2, respectively, having length of 20 bits. In case the packets in concern belong to

the same aggregation path, for example, the first 8 bits are allocated for identifying aggregation path, and the latter 12 bits are allocated for identifying individual paths, being used by respective LER1 to LER5, LSR6 and LSR7. The field in MPLS header to be used for identifying packets (paths) consists of 20 bits which is equivalent to the internal managed group of IDs sufficiently large to represent all network hardware paths). Nomura does not disclose a database of multicast IP addresses. Ku et al. discloses a database for multicast ID list and identification of the LSP look-ups (Fig. 6, element 612, col 16, lines 18-21 and col 20, lines 7-11). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the database as taught by Ku et al. in the system of Nomura to store the multicast IP addresses in order to provide an advantage of communicating data of different types and formats (col 24, lines 26-28).

5. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nomura (U.S. Publication No. 2002/0103924) in view of Cao et al. (U. S. Patent No. 6,721,269).

Regarding Claim 15, Nomura discloses a processor operable to assign a path ID for each path within a path group, the path ID for each path comprising an IP address, compare all path IDs in each path group, and assign a common hardware resource to groups having matching path IDs, wherein the path group contains IP paths, MPLS paths, or both IP and MPLS paths; and memory for storing the path IDs. Nomura does not disclose wherein the path IDs assigned for MPLS paths comprise broadcast IP

addresses of form 255.x.x.x. Cao et al. discloses wherein the path IDs assigned for MPLS paths comprise broadcast IP addresses of form 255.x.x.x. (Fig. 1 and Fig. 2; col 5, lines 7-25; col 9, lines 6-17. The IP destination mask 304 in Fig. 2 is used to obtain the effective bits from the destination address field of a packet, such as 255.255.0.0 which may be employed to select the first sixteen bits of a given IP destination address which is associated with IP addresses of form 255.x.x.x.). It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the 255.255.0.0 to obtain the effective bits from the destination address field of a packet as taught by Cao et al. in the system of Nomura in order to rapidly establish a new path in response to the failure of a path (see abstract).

## *Conclusion*

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 6,697,361 to Fredette et al. relates to a method and apparatus for stream aggregation in a multiprotocol label switching network environment.

U.S. Patent No. 6,795,433 to Li relates to a method of processing a multicast packet being sent from a multicast source address to members of a multicast group.

U.S. Publication No. 2002/0129086 to Garcia-Luna-Aceves et al. relates to a technique for expediting unicast and multicast routing-table lookups achieved by organizing routing-table entries into clusters, and by using pointers to such clusters in the data packets being switched.

The above prior art are cited to further show the same field of endeavor with respect to the applicant's claimed invention.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to F. Lin Khoo whose telephone number is 571-272-5508. The examiner can normally be reached on flex time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wellington Chin can be reached on 571-272-3134. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ajit Patel
Primary Examiner